

Testimony of David Burt, Chief Executive Officer and Founder of DeltaTerra Before the Senate Committee on the Budget

“A Burning Issue: The Economic Costs of Wildfires”

March 8, 2023



Good morning Chairman Whitehouse, Ranking Member Grassley, and members of the Senate Committee on the Budget. My name is David Burt and I am the Chief Executive Officer of DeltaTerra Capital, an investment research firm I founded in 2019 with our team of experienced mortgage bond investors and engineers. DeltaTerra uses its suite of economic and financial risk models developed over decades of market research to bridge climate science and investment science towards practical applications in capital markets. By translating newly available scientific estimates of physical risk into actionable insights for investors, lenders, and policymakers, DeltaTerra aims to accelerate an orderly transition to a climate-resilient financial system and society.

Thank you for the opportunity to share our wildfire risk insights with the committee. We applaud your attention to these matters and are humbled by the opportunity to contribute. I spoke with the Senate Democrats’ Special Committee on the Climate Crisis in March of 2020 on the broader topic of climate mispricing risks in property and mortgage markets. Since that hearing, we have experienced seismic shifts in monetary policy, mortgage rates, consumer housing and work preferences, and asset prices. Many of these changes have served to further exacerbate the insurance mispricing issues we research, setting the stage for a difficult asset bubble workout in the years to come. As home insurance premiums reset to sustainable levels and local economies struggle under the weight of increasing infrastructure and disaster recovery costs, we believe fundamental cracks appearing in many at-risk markets will become chasms. Acute real estate market corrections strain the economy and American households as consumer balance sheets are eroded by home equity losses, housing-related jobs dry up, and foreclosures mount.

The longer the markets take to price in these challenges, the worse the ultimate reckoning will be. In our investment science-based approach, we model market impacts in two scenarios of increasing temperature and property damage expectations.

- The **base case scenario**, a conservative estimate of climate impact in our view, is modeled on the IPCC mid-case scenario of RCP 4.5 wherein substantial global efforts are made to reduce greenhouse gas emissions. While emissions peak around 2040 in this scenario, temperatures continue to climb for many decades and reach levels that are two to three degrees Celsius higher than they were in preindustrial times. The connection between increasing temperatures and property damages is well-documented and we anticipate current and expected insurance premiums will rise to cover scenario-projected damages.

Even in our base case scenario, the closure of large existing insurance gaps (particularly around flooding and wildfire risk) and a growing understanding of increasing risk in RCP 4.5 result in roughly 20% of the nation's communities experiencing a Great Recession-like asset value correction, as fewer and fewer households are able to afford rapidly escalating ownership costs. Even one-fifth of a great recession would have budgetary implications, particularly given the localized nature of the shocks that could increase the need for federal assistance. While local and state budgets all have some cushion for declining property tax revenue and economic bailouts for constituents, the concentrated pockets of value destruction modeled in the scenario may overwhelm local protections even as less-exposed regions thrive.

- In our **bear case scenario**, markets start to price in even greater ownership cost hikes and other problems that could materialize in the IPCC downside scenario, RCP 8.5. This scenario assumes policymakers take no adaptation actions to reduce catastrophic event damages or mitigative actions to limit warming and future catastrophic events. Very high temperature increases, rising insurance costs, and growing risk of acute catastrophic events would follow. Bear case modeled asset value declines are nearly double those in the base case and the risk of systemic failure increases substantially.

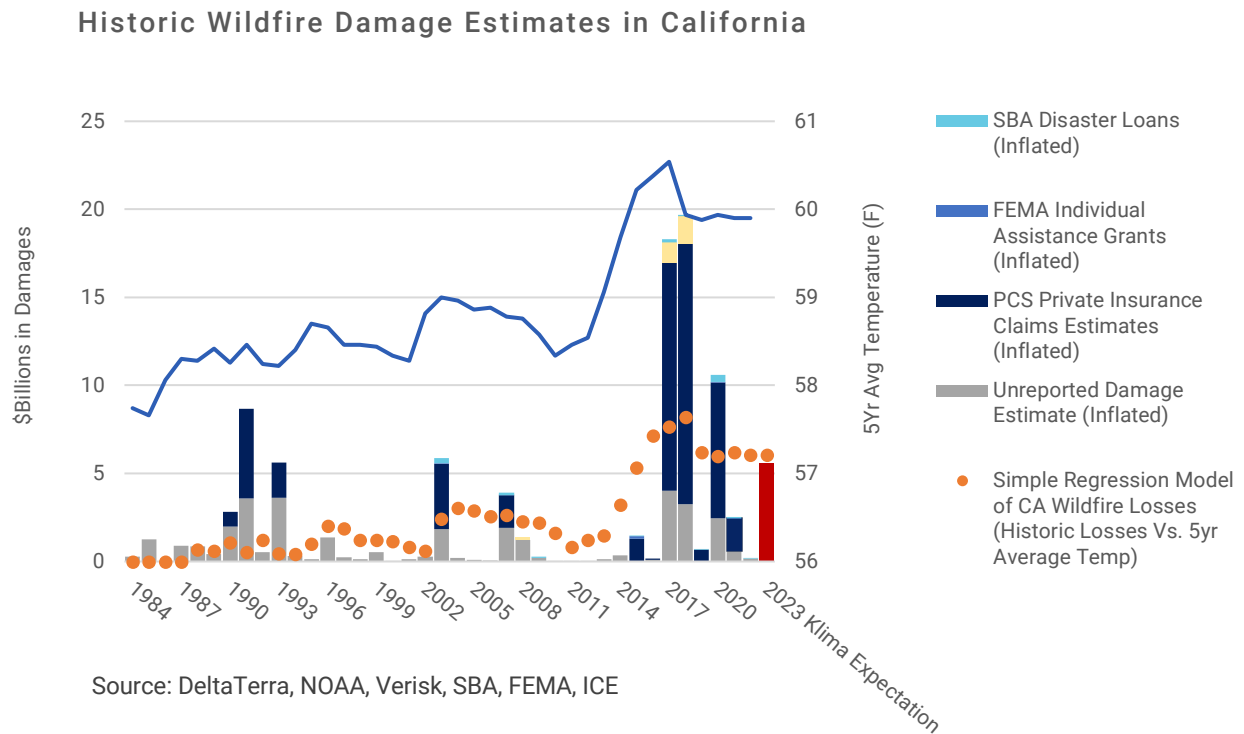
We like to think of the difference between the base case and bear case scenarios as the price of total inaction. These are meant to be guardrail scenarios, where the actual outcome is probably somewhere in the middle depending on how quickly the global community can adapt and mitigate.

In an analysis of the U.S. single-family home market in 2021, we identified 4.1 million homes in communities with high exposure to wildfire risk, which we defined as a census tract home market with more than .25% in climate-conditioned hazard model damages in 2021. A sharp and persistent increase in wildfire damages in the state of California in the late 2010's cost insurance companies billions and drew into question longstanding methodologies for determining profitable insurance premium rates. Using scientifically derived physical risk data from the Intercontinental Exchange (ICE) and a variety of realized insurance claims data from FEMA and Verisk PCS, we calculated 2021 total expected wildfire damages for exposed communities to be \$9.6 billion per year. We also estimated the current amount being charged for wildfire protection for these homes under the prior rate setting strategy to be \$1.5 billion per year.

The closure of this wildfire insurance pricing gap, along with anticipation of future wildfire risk increases in RCP 4.5, lead to \$317 billion in property value losses for risky communities in our base case scenario. In our bear case scenario, the loss projection for these homes would grow to \$495 billion as mitigation and adaptation expectations deteriorate and markets price in dire outcomes for property damage and local economies. Following the cessation of reckless lending practices in 2007, it took about five years for asset prices to fully reflect implications of the more cautious lending environment. We see supply and demand changes now in risky markets similar to early trends that the 2007-2012 cycle and have no reason to think this adjustment should take more or less time, so we envision a five-year cycle during which many Americans face financial risks related to wildfires.

▶ 1. Damages have been increasing with temperature on a consumer price index (CPI) and housing stock-adjusted basis.

Even after accounting for CPI and growth in the housing stock, damages to California homes have more than doubled over the last 30 years, during which average temperatures there have increased by approximately 1.5 degrees Celsius. Given a mid-case (RCP 4.5) expectation of another 1.5 degrees of warming over the next 30 years, we expect to see significant increases in risk and damages in the future as well.



▶ 2. Insurers pulling away from high wildfire risk exposure.

If a homeowner in California is denied insurance from a private insurance company, they can apply for insurance from the state’s insurer of last resort, the California FAIR Plan. In the table below from the annual [California Department of Insurance Fact Sheet](#), we can see an obvious spike in new FAIR policies in 2019 following back-to-back years of very high wildfire losses in 2017 and 2018. While California slowed the private insurance exodus in the state by issuing a series of one-year moratoriums on insurer nonrenewal following disaster declarations, the increase in FAIR policies has continued; the number almost doubled from 2015 to 2021 while traditional insurance policies only increased by 4%.

Appendix A: Number of New, Renewed, and Non-Renewed Homeowners' Policies in the State

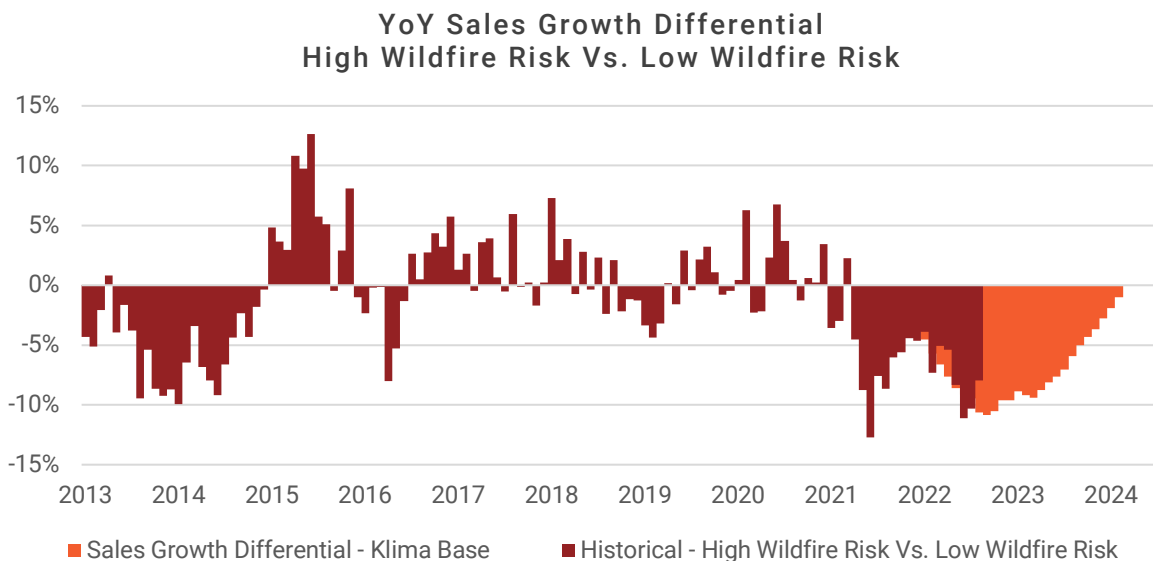
Number of Homeowners' Policies Statewide									
Voluntary Market ¹					FAIR Plan			Surplus Lines	
Year	New	Renewed	Non-	Non-	New	Renewed	Non-	New	Renewed
			renewed	renewed			renewed		
			Consumer-	Insurer-					
			Initiated	Initiated					
2021	1,107,169	7,621,326	876,760	241,662	66,652	201,579	38,940	6,326	6,450
2020	1,057,402	7,631,979	805,787	186,440	75,477	163,052	27,210	7,750	8,276
2019	1,102,130	7,540,135	787,795	234,843	73,557	116,233	25,543	11,912	9,620
2018	979,638	7,546,700	749,179	165,008	23,049	117,398	22,154	8,247	11,547
2017	978,576	7,510,275	751,807	166,285	22,017	118,295	21,740	6,660	11,034
2016	966,610	7,476,478	738,436	178,315	22,643	118,549	21,979	7,431	9,213
2015	944,639	7,412,985	717,522	182,059	22,740	118,651	20,944	6,503	7,881

Source: [California Department of Insurance](#)

▶ 3. Fundamental trends for high-risk homes are deteriorating.

When a homeowner is forced to secure an insurance policy from the state insurer of last resort, their premium usually increases substantially. Millions of homeowners **and prospective homebuyers** are now facing this prospect and the impact on buyer behavior is observable in high frequency market data.

In an analysis of asset-level transaction data from LightBox and asset-level wildfire risk data from the First Street Foundation, we calculated differentials in year-over-year sales growth rates between all homes with very high wildfire risk (First Street Foundation FireFactor score ≥ 7) versus those with lower risk (FireFactor < 7).

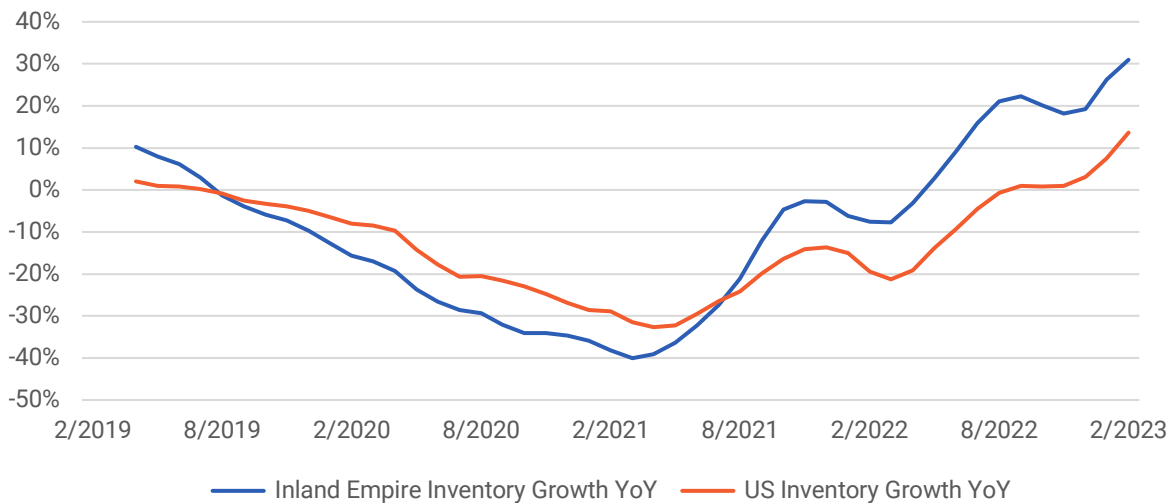


Source: DeltaTerra, LightBox, The First Street Foundation

The supply picture for risky markets looks similarly challenging. While we have yet to map asset-level climate risk data to listings data, an analysis of sales and inventory data from Zillow Research for California’s Inland Empire region provides a window into likely supply trends for wildfire-exposed homes. This is because Inland Empire (composed of Riverside and San Bernardino counties) contains both the highest number and highest concentration of high wildfire risk homes in any metro region covered by Zillow’s sales transaction and for-sale home counts. Of the 1.1 million single-family homes in the region, more than one-third have a FireFactor score of 7 or above, signifying severe wildfire risk.

The chart below shows year-over-year growth in homes for sale for the Inland Empire relative to the U.S. overall. While supply tightened considerably for the Inland Empire during the rush for affordable housing with attractive work-from-home characteristics, supply started increasing in 2022 as increasing mortgage rates dampened demand and more owners became sellers in the face of rising insurance costs.

Inland Empire & US Annual Growth in Homes For Sale



Source: DeltaTerra, Zillow

The underperformance in sales growth rates for these properties began in 2021 and sales trends typically act on prices with a one-to-two-year lag. We therefore expect to see price impacts in high wildfire risk markets very soon, if they aren’t already underway. In our base case scenario, we model a -20% price correction playing out over the next five years in exposed communities across the continental U.S. This is an average and some localized predictions are for much steeper declines. In our bear scenario, the aggregate value correction grows to -33%.

4. Implications of a housing price correction.

When deteriorating fundamentals translate to asset value declines for these riskier-than-anticipated homes, many households could become financially stretched and unable to weather any economic volatility. We used behavioral models commonly applied in mortgage credit investing to forecast scenario defaults given impacts on borrower ability to pay (as measured by adjusted debt-to-income ratios) and borrower willingness to pay (as measured by adjusted loan-to-value ratios). In our base case scenario, we model a default rate on agency mortgage loans exposed to high wildfire risk of 5.6%. In our bear scenario this expectation almost doubles to a rate of 11.7%, which translates to foreclosure for more than one in every ten families that owns one of these homes and has an agency mortgage.

If we assume that the agency loans modeled in our analysis are representative of all outstanding mortgages and that half of the 4.1 million wildfire-exposed homes carry some mortgage debt, this translates to 115,000 foreclosures in the base scenario and 240,000 in the bear case from a repricing of wildfire risk alone.

Beyond increasing damage expectations in an unchecked warming scenario, there are other factors that could play into the bear scenario described above;

- Unchecked development in wildland urban interfaces (WUI's) – While land use restrictions are unpopular, they may be needed to reduce an otherwise natural increase in exposure (and budgetary liability). Without accounting for the increased wildfire risk accompanying higher temperatures, expansion of the WUI often looks attractive relative to infill development.
- Increasing utility and water costs in the same communities being threatened by acute wildfire events may magnify structural ownership cost hikes from increasing insurance premiums.
- Frequent evacuations, electricity blackouts, and air pollution that make quality of life increasingly inferior relative to less exposed regions could create additional demand destruction in at risk communities.

While some wealthy households have the resources to absorb higher insurance costs and home value declines, [academic research](#) suggests that low and moderate income households that lack the resources to move as conditions deteriorate will be left with the largest challenges. This dynamic along with concentration of the risk in specific geographies will likely lead to increasing reliance on federal assistance in impacted areas and losses on federally guaranteed mortgage loans, so we would encourage continued attention to these matters in budgetary considerations.

Thank you for your time and consideration.

Dave Burt and the DeltaTerra Capital team